

### FOR PENTAGRID CONVERTER APPLICATIONS IN AUTOMOBILE RECEIVERS

## DESCRIPTION AND RATING

The 12AD6 is a miniature heptode primarily intended to perform the combined functions of mixer and oscillator in automobile radio receivers. The tube is specially designed to operate with plate and screen voltages supplied directly from a 12-volt storage battery.

### GENERAL

#### ELECTRICAL

Cathode—Coated Unipotential

Heater Voltage, AC or DC . . . . . 12.6\* Volts

Heater Current . . . . . 0.15 Amperes

Direct Interelectrode Capacitances      **With Shield†**      **Without Shield**

Grid-Number 3 to All . . . . . 8.0      8.0       $\mu\mu\text{f}$

Plate to All . . . . . 13      8.0       $\mu\mu\text{f}$

Grid-Number 1 to All . . . . . 5.5      5.5       $\mu\mu\text{f}$

Cathode to All Except Grid-Number 1 . . . . . 20      15       $\mu\mu\text{f}$

Grid-Number 3 to Plate, maximum . . . . . 0.25      0.3       $\mu\mu\text{f}$

Grid-Number 1 to Grid-Number 3, maximum . . . . . 0.15      0.15       $\mu\mu\text{f}$

Grid-Number 1 to Plate, maximum . . . . . 0.05      0.1       $\mu\mu\text{f}$

Grid-Number 1 to Cathode . . . . . 3.0      3.0       $\mu\mu\text{f}$

#### MECHANICAL

Mounting Position—Any

Envelope—T-5½, Glass

Base—E7-1, Miniature Button 7-Pin

### MAXIMUM RATINGS

#### DESIGN-CENTER VALUES

Plate Voltage . . . . . 30 Volts

Screen-Supply Voltage . . . . . 30 Volts

Screen Voltage . . . . . 30 Volts

Positive DC Grid-Number 3 Voltage . . . . . 0 Volts

Negative DC Grid-Number 3 Voltage . . . . . 30 Volts

DC Cathode Current . . . . . 20 Milliamperes

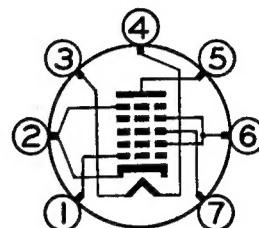
Heater-Cathode Voltage

Heater Positive with Respect to Cathode . . . . . 30 Volts

Heater Negative with Respect to Cathode . . . . . 30 Volts

Grid-Number 3 Circuit Resistance . . . . . 10 Megohms

### BASING DIAGRAM

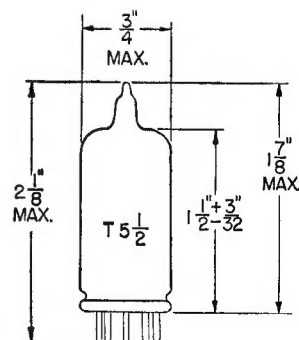


RETMA 7CH

### TERMINAL CONNECTIONS

- Pin 1—Grid Number 1 (Oscillator Grid)
- Pin 2—Cathode and Grid Number 5
- Pin 3—Heater
- Pin 4—Heater
- Pin 5—Plate
- Pin 6—Grid Numbers 2 and 4 (Screen)
- Pin 7—Grid Number 3 (Signal Grid)

### PHYSICAL DIMENSIONS



RETMA 5-2

## CHARACTERISTICS AND TYPICAL OPERATION

### CONVERTER SERVICE

Plate Voltage	12.6	Volts
Screen Voltage	12.6	Volts
Grid-Number 3 Supply Voltage	0	Volts
Grid-Number 3 Resistor (Bypassed)	2.2	Megohms
Grid-Number 1 Voltage, RMS, approximate	1.6	Volts
Grid-Number 1 Resistor	33000	Ohms
Plate Resistance, approximate	1.0	Megohms
Conversion Transconductance	260	Micromhos
Plate Current	0.45	Milliamperes
Screen Current	1.5	Milliamperes
Grid-Number 1 Current	0.050	Milliamperes
Grid-Number 3 Voltage, approximate		
$G_c = 5$ Micromhos	-2.2	Volts
Grid-Number 3 Voltage, approximate		
$G_c = 20$ Micromhos	-1.8	Volts

### OSCILLATOR CHARACTERISTICS, NOT OSCILLATING

Plate Voltage	12.6	Volts
Screen, Connected to Plate		
Grid-Number 3 Voltage	0	Volts
Grid-Number 1 Voltage	0	Volts
Amplification Factor†	9.0	
Transconductance‡	3800	Micromhos
Cathode Current	5.0	Milliamperes
Grid-Number 1 Voltage, approximate		
$I_b = 10$ Microamperes	-4	Volts

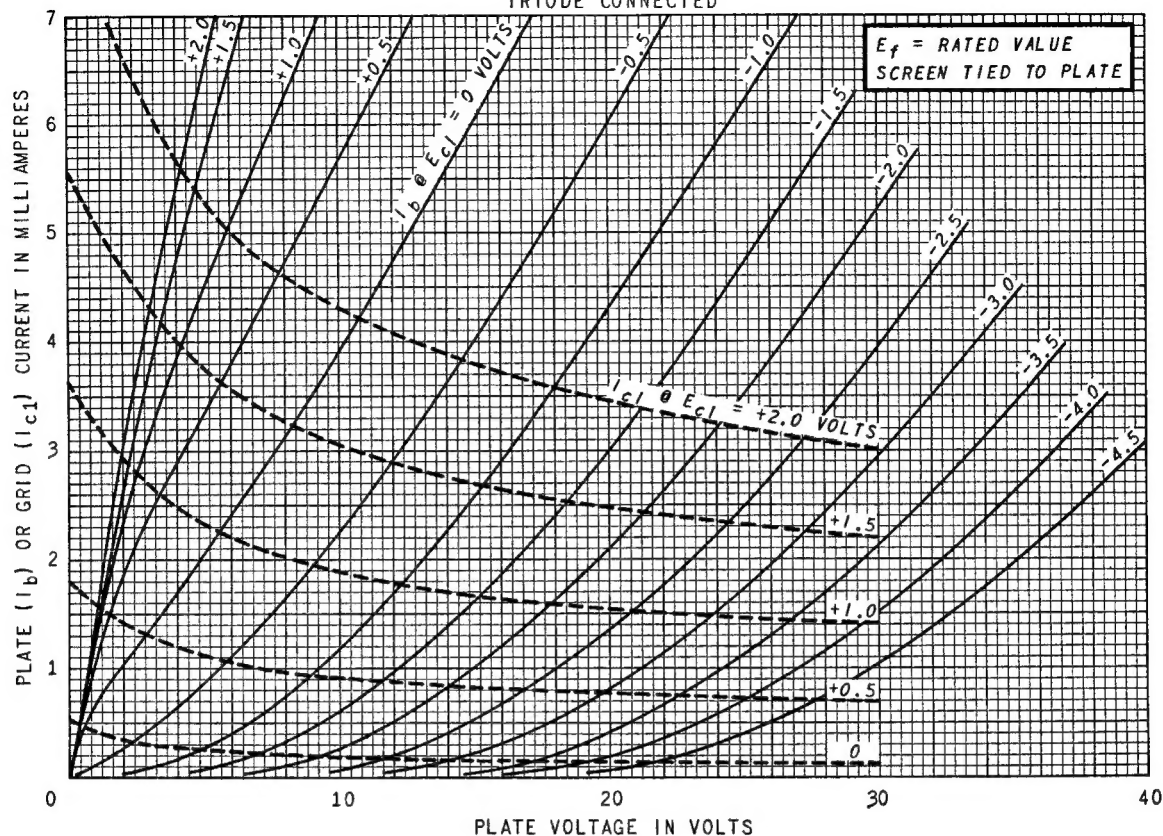
\* When used in automobile service from a 12-volt source, under no circumstances should the heater voltage be less than 10.0 volts or more than 15.9 volts. These extreme variations in heater voltage may be tolerated for short periods; however, operation at or near these absolute limits in heater voltage necessarily involves sacrifice in performance at low heater voltage and in life expectancy at high heater voltage. Equipment reliability can be significantly increased with improved supply-voltage regulation.

† With external shield (RETMA 316) connected to pin 2.

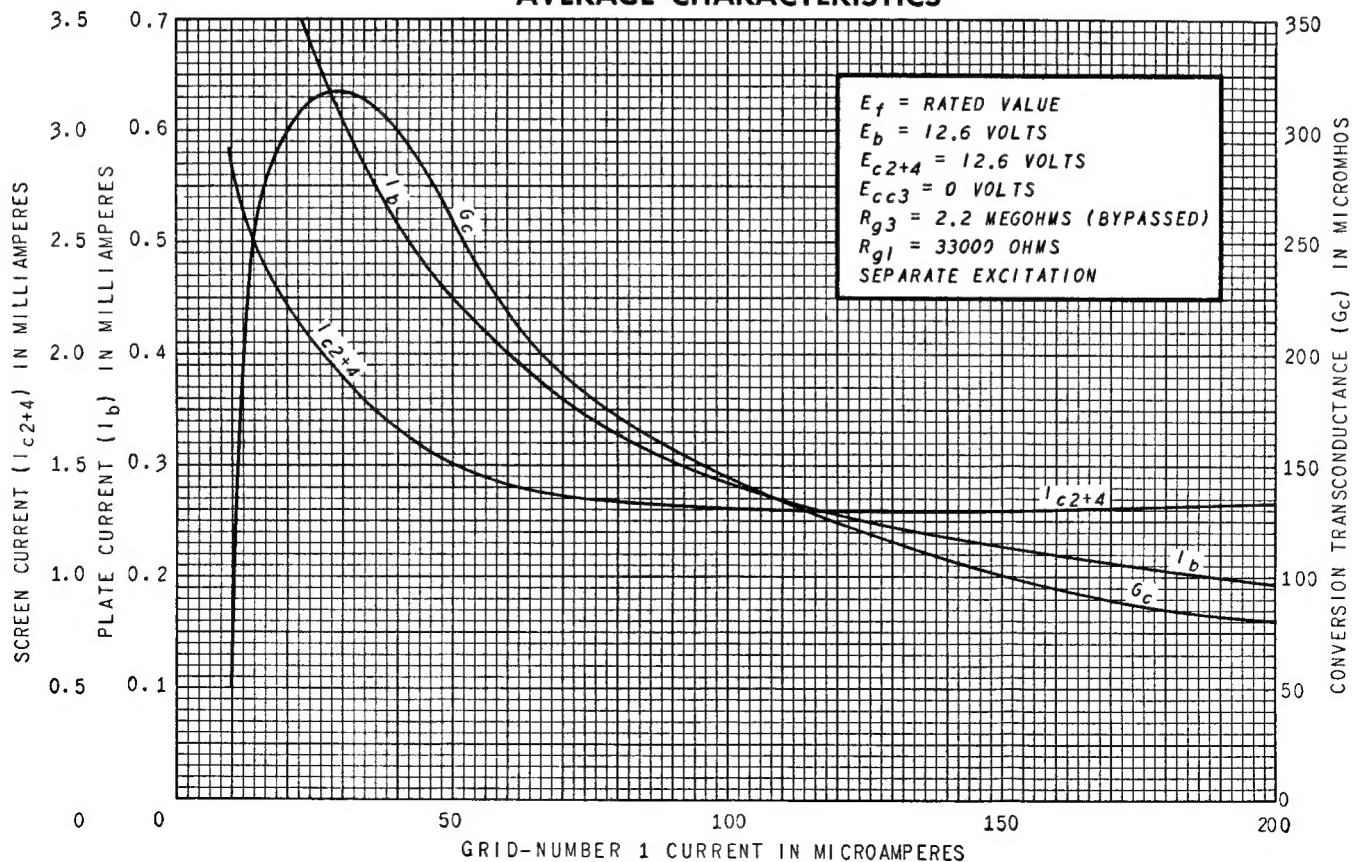
‡ Between grid-number 1 and grids number 2 and 4 connected to plate.

# AVERAGE PLATE CHARACTERISTICS

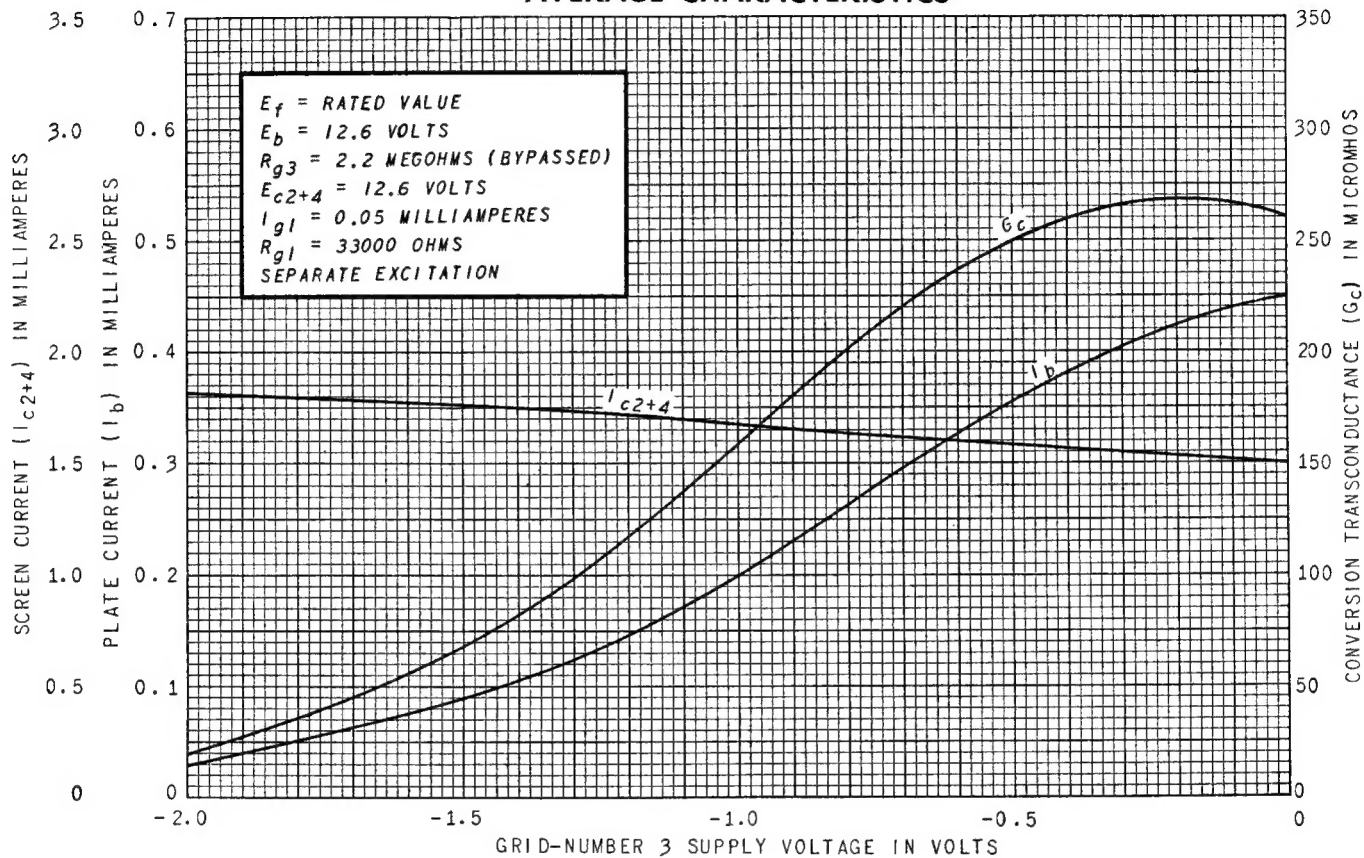
TRIODE CONNECTED



# AVERAGE CHARACTERISTICS



### AVERAGE CHARACTERISTICS



ELECTRONIC COMPONENTS DIVISION  
**GENERAL ELECTRIC**  
 Schenectady 5, N. Y.